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WOODS POND, BERKSHIRE COUNTY, MASSACHUSETTS, EPA REGION I.

Pacific Northwest Environmental Research Laboratory

Prepared for:

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April 1975

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U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EUTROPHICATION SURVEY

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16. ABSTRACT

Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
eutrophication lakes nutrients phosphorus nitrogen loading		05B 05C

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REPORT
ON
WOODS POND
BERKSHIRE COUNTY
MASSACHUSETTS
EPA REGION I
WORKING PAPER No. 223

WITH THE COOPERATION OF THE

MASSACHUSETTS DIVISION OF WATER POLLUTION CONTROL

AND THE

MASSACHUSETTS NATIONAL GUARD

APRIL, 1975

CONTENTS

	Page
Foreword	ii
List of Massachusetts Study Lakes	iv
Lake and Drainage Area Map	v
Sections	
I. Conclusions	1
II. Lake and Drainage Basin Characteristics	3
III. Lake Water Quality Summary	4
IV. Nutrient Loadings	8
V. Literature Reviewed	13
VI. Appendices	14

FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to fresh water lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Massachusetts Division of Water Pollution Control for professional involvement and to the Massachusetts National Guard for conducting the tributary sampling phase of the Survey.

Thomas C. McMahon, Director, John R. Elwood, Supervisory Sanitary Engineer, Eben Chesebrough, Senior Chemist, and Peter A. Tennant, Senior Sanitary Engineer of the Massachusetts Division of Water Pollution Control provided invaluable lake documentation and counsel during the course of the Survey.

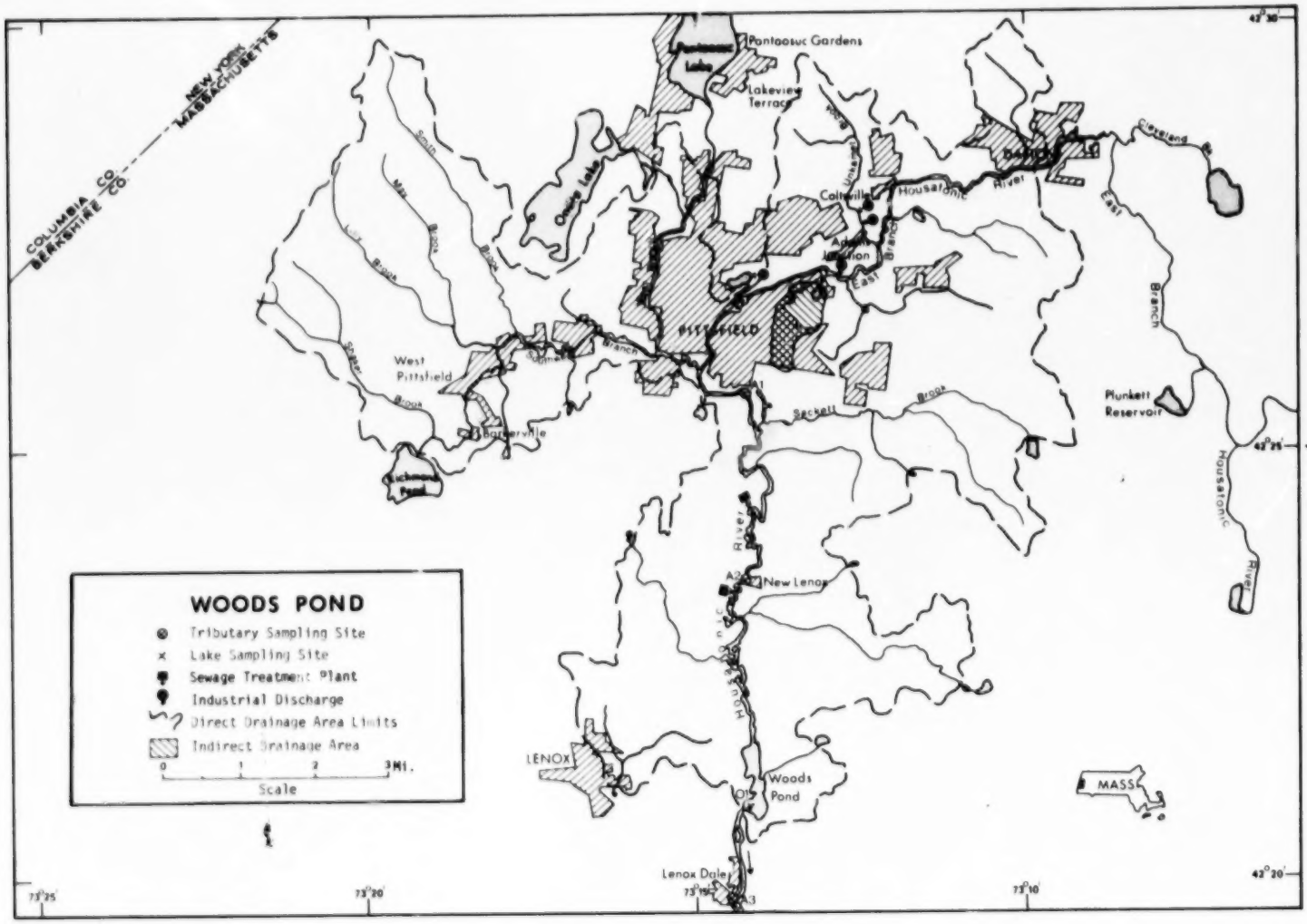
Major General Vahan Vartanian, the Adjutant General of Massachusetts, and Project Officer Major William Flaherty, who directed the volunteer efforts of the Massachusetts National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF MASSACHUSETTS

LAKE NAME	COUNTY
Assabet-Concord River Impoundments	
Northboro	Worcester
Hudson	Middlesex
Maynard	Middlesex
Billerica	Middlesex
Hager Pond	Middlesex
Matfield Impoundment	Plymouth
Rochdale Pond	Worcester
Woods Pond	Berkshire


WOODS POND
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Plant
Industrial Discharge
Direct Drainage Area Limits
Indirect Drainage Area
0 1 2 3Mi.
Scale
COLUMBIA CO
BERKSHIRE CO
NEW YORK
MASSACHUSETTS
Pontoosuc Gardens
Lakeview Terrace
Onota Lake
PITTSFIELD
West Pittsfield
Richmond Pond
Housatonic River
Cleveland Res.
East Branch
Plunkett Reservoir
Housatonic River
New Lenox
LENOX
Woods Pond
Lenox Dale
MASS.
42°30'
42°25'
42°20'
73°25'
73°20'
73°15'
73°10'

WOODS POND

STORET NO. 2507

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate that Woods Pond is a hypereutrophic impoundment which receives heavy loads of phosphorus from municipal and industrial sources. Heavy algal blooms and broad surface coverage by duckweed are recurrent phenomena. High algal assay control yields substantiate the high primary productivity reported. Turbidity was high and dissolved oxygen was depressed when sampled.

B. Rate-Limiting Nutrient:

Algal assay results indicate that Woods Pond was nitrogen limited at the time the sample was collected. The ratio of inorganic nitrogen to dissolved phosphorus (approximately 3 to 1 on each sampling date) indicates that nitrogen limitation is a sustained rather than a transient condition in the pond.

C. Nutrient Controllability:

1. Point sources--During the sampling year, Woods Pond received a total phosphorus load at a rate more than 60 times that proposed by Vollenweider (in press) as "dangerous"; i.e., a eutrophic rate (see page 12). Now, Vollenweider's model probably does not apply to water bodies with short detention

times, and the mean hydraulic retention time of Woods Pond is a very short 19 hours. Nonetheless, the existing trophic condition of the pond is evidence of excessive nutrient loads.

It is estimated that the point sources considered in this study collectively contributed over 93% of the total phosphorus load. While even complete removal of phosphorus at these sources would still leave a loading rate nearly four times the eutrophic rate, considering the very short hydraulic retention time of Woods Pond and the probability that Vollenweider's model is not applicable, it is likely that a high degree of phosphorus removal at the point sources would result in a decrease in the incidence and severity of nuisance algal blooms as well as reduce the phosphorus loading to downstream Housatonic River impoundments.

2. Non-point sources--The estimated non-point phosphorus export rate of the Housatonic River of 107 lbs/mi^2/yr is comparable to the export rates of Massachusetts streams studied elsewhere; e.g., Hager Pond and Rochdale Pond tributaries.

In all, it is estimated that non-point sources, including precipitation, contributed a little over 7% of the total phosphorus load to Woods Pond during the sampling year.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS

A. Lake Morphometry†:

1. Surface area: 122 acres.
2. Mean depth: 4 feet.
3. Maximum depth: 15 feet.
4. Volume: 488 acre-feet.
5. Mean hydraulic retention time: 19 hours.

B. Tributary and Outlet:
(See Appendix A for flow data)

1. Tributaries -

Name	Drainage area*	Mean flow*
Housatonic River	147.0 mi^2	266.9 cfs
Minor tributaries & immediate drainage -	24.8 mi^2	45.5 cfs
Totals	171.8 mi^2	312.4 cfs

2. Outlet -

Housatonic River	172.0 mi^2**	312.4 cfs

C. Precipitation***:

1. Year of sampling: 53.7 inches.
2. Mean annual: 42.0 inches.

---

† Chesebrough, 1975.
* Drainage areas are accurate within ±1%; gaged mean daily, monthly, and normalized monthly flows are accurate within ±15%; and ungaged mean daily, monthly, and normalized flows are accurate within ±20%.
** Includes area of lake.
*** See Working Paper No. 1, "Survey Methods, 1972".

III. LAKE WATER QUALITY SUMMARY

Woods Pond was sampled three times during the open-water season of 1972 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from a number of depths at the single station on the pond (see map, page v). During each visit, a depth-integrated (near bottom to surface) sample was collected for phytoplankton identification and enumeration, and a similar sample was collected for chlorophyll *a* analysis. During the last visit, a single five-gallon depth-integrated sample was collected for algal assays. The maximum depth sampled was four feet.

The results obtained are presented in full in Appendix B, and the data for the fall sampling period, when the pond essentially was well-mixed, are summarized below. Note, however, the Secchi disc summary is based on all values.

For differences in the various parameters at the other sampling times, refer to Appendix B.

A. Physical and chemical characteristics:

Parameter	Minimum	Mean	Median	Maximum
		FALL VALUES (10/08/72)		
Temperature (Cent.)*				
Dissolved oxygen (mg/l)*				
Conductivity (μmhos)	250	250	250	250
pH (units)	7.3	7.3	7.3	7.3
Alkalinity (mg/l)	79	79	79	79
Total P (mg/l)	0.309	0.309	0.309	0.309
Dissolved P (mg/l)	0.238	0.238	0.238	0.238
NO_2 + NO_3 (mg/l)	0.440	0.440	0.440	0.440
Ammonia (mg/l)	0.700	0.700	0.700	0.700
		ALL VALUES		
Secchi disc (inches)	24	43	36	68

* These parameters were not measured in October.

B. Biological characteristics:

1. Phytoplankton* -

Sampling Date	Dominant Genera	Number per ml
06/05/72	1. Asterionella	470
	2. Navicula	265
	3. Fragilaria	90
	4. Dinobryon	72
	5. Synedra	72
	Other genera	429
	Total	1,398
08/01/72	1. Flagellates	3,002
	2. Anabaena	778
	3. Dinobryon	651
	4. Cyclotella	380
	5. Synedra	325
	Other genera	1,121
	Total	6,257

2. Chlorophyll a -
(Because of instrumentation problems during the 1972 sampling, the following values may be in error by plus or minus 20 percent.)

Sampling Date	Station Number	Chlorophyll a (µg/l)
06/05/72	01	3.2
08/01/72	01	12.1
10/08/72	01	19.0

* The October sample was lost in shipment.

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.230	0.950	41.8
0.006 P	0.236	0.950	45.2
0.012 P	0.242	0.950	45.6
0.024 P	0.254	0.950	43.7
0.060 P	0.290	0.950	37.0
0.060 P + 10.0 N	0.290	10.950	64.4
10.0 N	0.230	10.950	61.6

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, indicates that the primary productivity in Woods Pond was very high at the time the assay sample was collected. The lack of significant increases in yield with increasing levels of phosphorus spikes, until nitrogen was also added, indicates that nitrogen was the limiting nutrient. Note that there was a significant increase in yield (compared to the control yield) when only nitrogen was added.

The pond data indicate nitrogen limitation at the other sampling times as well (N/P ratios were less than 3/1, and nitrogen limitation would be expected).

IV. NUTRIENT LOADINGS
(See Appendix C for data)

For the determination of nutrient loadings, the Massachusetts National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff months of March and April when two samples were collected. Sampling was begun in September, 1972, and was completed in October, 1973.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or averaged year were provided by the New England District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, the nutrient loads of the outlet at station A-3 were calculated using the mean concentrations and the mean annual flow. However, the phosphorus loads calculated in this way for the Housatonic River inlet at station A-2 were less than the sum of the upstream point-source loads, so the background phosphorus load of the river was estimated using the mean annual flow at station A-2 and the mean of the phosphorus concentrations measured in 1974 in the East and West branches of the Housatonic River (0.030 mg/l) by the Massachusetts Division of Water Pollution Control (Anonymous, 1974).

The nitrogen load for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) was estimated by using the adjusted (minus point

source) Housatonic River load, at station A-2, in lbs/mi^2/year, and multiplying by the ZZ area in mi^2. The ZZ phosphorus load was calculated using the mean phosphorus concentrations as at station A-2 and the mean annual ZZ flow.

The operator of the Pittsfield wastewater treatment plant provided monthly effluent samples and corresponding flow data. However, the North Lennox wastewater treatment plant and the General Electric Company discharges were not sampled, and the nutrient loads attributed to these sources were provided by the Massachusetts Division of Water Pollution Control (Chesebrough, 1975; Cooperman, et al., 1971).

It is assumed that the entire point-source nutrient loads reached Woods Pond during the sampling year.

A. Waste Sources:

1. Known municipal† -

Name	Pop. Served	Treatment	Mean Flow (mgd)	Receiving Water
Pittsfield	55,000	trickling filter,	7.000	Housatonic River
		sand filter	1.500	
		prim. clarifier	2.452	
North Lennox	2,350*	prim. clarifier	0.152	Housatonic

2. Industrial** -

Name	Product	Treatment	Mean Flow (mgd)	Receiving Water
General Electric Co.	?	none	4.100	E. Branch, Housatonic River

† Chesebrough, 1975.
* Includes seasonal residents.
** Cooperman, et al., 1971.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	lbs P/ yr	% of total
a. Tributaries (non-point load) -		
Housatonic River	15,765	5.4
b. Minor tributaries & immediate drainage (non-point load) -	2,690	0.9
c. Known muncipal STP's -		
Pittsfield	134,560	46.3
North Lennox	2,560	0.9
d. Septic tanks - Unknown	-	-
e. Known industrial -		
General Electric Company*	135,000	46.5
f. Direct precipitation** -	20	<0.1
Total	290,595	100.0

2. Outputs -

Pond outlet - Housatonic River 221,760

3. Net annual P accumulation - 68,835 pounds

* Cooperman, et al., 1971.
** See Working Paper No. 1.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	lbs N/yr	% of total
a. Tributaries (non-point load) -		
Housatonic River	741,390	49.4
b. Minor tributaries & immediate drainage (non-point load) -	125,080	8.3
c. Known municipal STP's -		
Pittsfield	620,350	41.4
North Lennox	11,680†	0.8
d. Septic tanks - Unknown	-	-
e. Known industrial -		
General Electric Company*	insignificant	-
f. Direct precipitation** -	1,180	0.1
Total	1,499,680	100.0

2. Outputs -

Pond outlet - Housatonic River 2,072,450

3. Net annual N loss - 572,770 pounds

D. Mean Annual Non-point Nutrient Export by Subdrainage Area:

Tributary	lbs $P/mi^2/yr$	lbs $N/mi^2/yr$
Housatonic River (estimated)	107	5,043

† Total Kjeldahl nitrogen only.
* Cooperman, et al., 1971.
** See Working Paper No. 1.

E. Yearly Loading Rates:

In the following table, the existing phosphorus loading rates are compared to those proposed by Vollenweider (in press). Essentially, his "dangerous" rate is the rate at which the receiving waters would become eutrophic or remain eutrophic; his "permissible" rate is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic rate would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with very short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
Units	Total	Accumulated	Total	Accumulated
lbs/acre/yr	2,381.9	564.2	12,292.5	loss*
grams/m^2/yr	266.98	63.24	1,377.8	-

Vollenweider loading rates for phosphorus ($g/m^2/yr$) based on mean depth and mean hydraulic retention time of Woods Pond:

"Dangerous" (eutrophic rate)	4.40
"Permissible" (oligotrophic rate)	2.20

* There was an apparent loss of nitrogen during the sampling year. This may have been due to nitrogen fixation in the pond, solubilization of previously sedimented nitrogen, recharge with nitrogen-rich ground water, unknown and unsampled point sources discharging directly to the pond, or underestimation of the nitrogen loads from Pittsfield, North Lennox, and/or the General Electric Co. discharges. Whatever the cause, a similar nitrogen loss has occurred at Shagawa Lake, Minnesota, which has been intensively studied by EPA's National Eutrophication and Lake Restoration Branch.

V. LITERATURE REVIEWED

Chesebrough, Eben W., 1975. Personal communication (review of preliminary report on Woods Pond). MA Div. Water Poll. Contr., Westborough.

Cooperman, A. N., R. A. Isaac, and W. R. Jobin, 1971. The Housatonic River, 1969 - Part C. MA Div. Water Poll. Contr., Boston.

Vollenweider, Richard A., (in press). Input-output models. Schweiz. Z. Hydrol.

VII. APPENDICES

APPENDIX A

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR MASSACHUSETTS 11/26/74

LAKE CODE 2507 WOODS POND

TOTAL DRAINAGE AREA OF LAKE 172.00

TRIBUTARY	SUB-DRAINAGE AREA	NORMALIZED FLOWS JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
2507A2	147.00	257.00	238.00	475.00	673.00	344.00	201.00	140.00	117.00	140.00	135.00	235.00	251.00	266.91
2507A3	172.00	301.00	279.00	556.00	788.00	402.00	236.00	164.00	137.00	164.00	158.00	275.00	294.00	312.53
2507ZZ	25.00	43.80	40.50	80.90	115.00	58.50	34.30	23.90	20.00	23.80	22.90	40.00	42.80	45.48

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 172.00
SUM OF SUB-DRAINAGE AREAS = 172.00
TOTAL FLOW IN = 3752.30
TOTAL FLOW OUT = 3754.00

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2507A2	9	72	82.00	9	69.80				
	10	72	134.00	21	108.00				
	11	72	385.00	18	318.00				
	12	72	575.00	16	551.00				
	1	73	532.00	21	641.00				
	2	73	493.00	3	1564.00				
	3	73	598.00	4	363.00	17	829.00		
	4	73	513.00	7	437.00	30	420.00		
	5	73	468.00	20	704.00				
	6	73	203.00	10	176.00				
	7	73	148.00						
	8	73	214.00	19	207.00				
2507A3	9	72	96.10	9	81.70				
	10	72	157.00	21	126.00				
	11	72	451.00	18	372.00				
	12	72	673.00	16	645.00				
	1	73	623.00	21	750.00				
	2	73	578.00	3	1830.00				
	3	73	701.00	4	425.00	17	970.00		
	4	73	600.00	7	511.00	30	492.00		
	5	73	547.00	20	824.00				
	6	73	238.00	10	206.00				
	7	73	174.00						
	8	73	251.00	19	242.00				
2507ZZ	9	72	13.90						
	10	72	22.70						
	11	72	65.60						
	12	72	98.00						
	1	73	90.70						
	2	73	83.80						
	3	73	102.00						
	4	73	87.60						
	5	73	79.60						
	6	73	34.70						
	7	73	25.30						
	8	73	36.60						

APPENDIX B

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 74/11/26

250701
42 21 00.0 073 14 30.0
WOODS POND
25 MASSACHUSETTS

11EPALES
4

2111202
0006 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/05	10 40	0000	18.4	6.6	36	220	7.50	96	0.370	0.380	0.165	0.133
72/08/01	09 50	0000			68	340	7.10	128	0.870	0.870	0.439	0.353
	09 50	0004	19.4	5.0		340	7.10	124	0.830	0.850	0.417	0.327
72/10/08	15 35	0000			24	250	7.35	79	0.440	0.700	0.309	0.238

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/05	10 40	0000	3.2J
72/08/01	09 50	0000	12.1J
72/10/08	15 35	0000	19.0J

J VALUE KNOWN TO BE IN ERROR

APPENDIX C

TRIBUTARY and WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 74/11/26

2507A1 LS2507A1
42 26 00.0 073 14 00.0
HOUSATONIC RIVER
25 705 E PITTSFIELD
I/WOODS POND
HOLMES RD BRDG ABOV PITTSFISLD STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/09	10 10		0.310	1.800	0.430	0.280	0.490
72/10/21	12 45		0.380	1.000	0.138	0.490	1.200
72/12/16	09 45		0.336	2.100	0.130	0.008	0.025
73/01/21	09 00		0.440	1.600	0.126	0.010	0.035
73/02/03	09 30		0.290	1.100	0.077	0.014	0.115
73/03/04	10 45		0.340	0.840	0.126	0.008	0.090
73/03/17	13 30		0.260	2.520	0.115	0.008	0.065
73/04/07	09 30		0.280	3.900	0.680	0.012	0.040
73/04/30	10 10		0.273	2.100	0.170	0.013	0.055
73/05/20	09 20		0.130	1.890	0.071	0.009	0.040
73/06/10	09 00		0.200	2.100	0.650	0.015	0.055
73/08/19	09 00		0.270	3.500	0.189	0.033	0.085

STORET RETRIEVAL DATE 74/11/26

2507A2 LS2507A2
42 23 30.0 073 14 30.0
HOUSATONIC RIVER
25 7.5 E PITTSFIELD
1/WOODS POND
NEW LENOX RD BRDG BELO PITTSFIELD STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/09	10 25		0.010K	3.100		1.100	1.370
72/10/21	13 00		0.710	1.650	0.590	0.135	0.930
72/11/18	13 55		0.375	3.400	0.275	0.147	0.294
72/12/16	10 00		0.520	1.600	0.310	0.105	0.180
73/01/21	09 20		0.550	0.810	0.260	0.075	0.165
73/02/03	09 50		0.320	1.700	0.180	0.050	0.220
73/03/04	10 55		0.440	0.800	0.252	0.078	0.150
73/03/17	14 00		0.336	0.650	0.110	0.030	0.090
73/04/07	09 50		0.430	2.520	0.530	0.290	0.470
73/04/30	10 30		0.590	2.600	0.670	0.210	0.315
73/05/20	09 35		0.200	3.650	0.210	0.088	0.170
73/06/10	09 20		0.640	3.360	1.160	0.340	0.480
73/08/19	09 15		0.620	1.700	0.399	0.240	0.375

STORET RETRIEVAL DATE 74/11/26

2507A3 LS2507A3
42 20 00.0 073 15 00.0
HOUSATONIC RIVER
25 7.5 E LEE
O/WOODS POND
EAST ST BRDG NEAR LENOX DALE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/09	10 45		1.240	1.450	0.430	0.640	0.910
72/10/21	13 30		0.620	1.400	0.520	0.336	0.450
72/12/16	10 15		0.500	2.500	0.315	0.180	0.270
73/01/21	09 35		0.500	2.650	0.390	0.084	0.210
73/02/03	10 10		0.320	2.400	0.270	0.052	0.210
73/03/04	11 10		0.480	1.050	0.360	0.130	0.210
73/03/17	14 30		0.330	1.890	0.190	0.060	0.230
73/04/07	10 15		0.370	3.550	0.420	0.105	0.185
73/04/30	09 50		0.600	4.000	0.550	0.189	0.375
73/05/20	09 50		0.198	3.500	0.231	0.105	0.210
73/06/10	09 45		0.640	4.950	0.640	0.378	0.525
73/08/19	09 30		0.610	4.200	0.370	0.300	0.460

STORET RETRIEVAL DATE 74/11/27

250750 TF250750 P055000
42 24 30.0 073 14 30.0
PITTSFIELD
25 7.5 PITTSFIELD E
T/WOODS POND
HOUSATONIC RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
72/11/24	08 00								
CP(T)-			4.100	8.500	2.500	0.380	0.460	10.700	9.840
72/11/24	19 00								
72/12/29	08 00								
CP(T)-			6.100	11.000	0.069	2.600	3.500	11.600	13.100
72/12/29	19 00								
73/01/24	09 00								
CP(T)-			5.100	11.000	0.560	2.600	3.450	14.200	13.200
73/01/24	20 00								
73/02/21	08 00								
CP(T)-			4.800	10.000	2.000	3.700	4.400	9.790	12.600
73/02/21	19 00								
73/03/22	09 00								
CP(T)-			5.300	7.800	0.510	2.200	2.900	13.100	12.300
73/03/22	20 00								
73/04/26	09 00								
CP(T)-			6.500	12.000	2.800	3.300	4.200	10.500	12.600
73/04/26	20 00								
73/05/24	09 00								
CP(T)-			4.600	13.000	1.700	3.400	4.100	12.100	11.100
73/05/24	20 00								
73/06/21	09 00								
CP(T)-			7.200	13.000	1.940	3.625	4.600	9.790	10.600
73/06/21	20 00								
73/07/26	08 30								
CP(T)-			7.500	23.000	2.200	3.700	4.600	8.770	10.900
73/07/26	19 30								
73/08/29	09 00								
CP(T)-				14.000		3.600	4.800	10.500	11.100
73/08/29	20 00								
73/09/27	09 00								
CP(T)-			7.200	19.000	3.100	4.200	5.700	8.310	8.930
73/09/27	20 00								
73/10/30	09 00								
CP(T)-			5.300	17.000	4.000	4.200	6.100	8.720	7.960
73/10/30	20 00								

STORET RETRIEVAL DATE 74/11/27

250750 TF250750 P055000
42 24 30.0 073 14 30.0
PITTSFIELD
25 7.5 PITTSFIELD E
T/WOODS POND
HOUSATONIC RIVER
11EPALES 2141204
0000 FEET DEPTH
4

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/11/28 CP(T)- 73/11/28	09 00 20 00		3.800	17.500	5.400	3.570	5.200	9.160	8.150